

ABSTRACT

A semiconductor chip having an exposed metal terminating pad thereover, and a separate substrate having a corresponding exposed metal bump thereover are provided. A conducting polymer plug is formed over the exposed metal terminating pad. A conforming interface layer is formed over the conducting polymer plug. The conducting polymer plug of the semiconductor chip is aligned with the corresponding metal bump. The conforming interface layer over the conducting polymer plug is mated with the corresponding metal bump. The conforming interface layer is thermally decomposed, adhering and permanently attaching the conducting polymer plug with the corresponding metal bump. Methods of forming and patterning a nickel carbonyl layer are also disclosed.